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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/588,549	06/07/2000	Ichiro Okumura	35.C14536	9162

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EXAMINER

KAO, CHIH CHENG G

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 11/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/588,549

Applicant(s)

OKUMURA ET AL.

Examiner

Chih-Cheng Glen Kao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 17 October 2001 and 02 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 6-12, 16-29, 31, 32 and 34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 13-15, 30, 33 and 35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 01 March 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____

- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of claims 1-5, 13-15, 30, and 33 of Group I with claim 35 being generic in Paper No. 11 is acknowledged. The traversal is on the ground(s) that it would be an undue burden to examine five species as a reasonable number. This is not found persuasive because the species still recite mutually exclusive characteristics, which are patentably distinct. Thus examining five patentably distinct inventions is considered an undue burden.

The requirement is still deemed proper and is therefore made FINAL.

2. This application contains claims 6-12, 16-29, 31, 32, and 34 drawn to an invention nonelected with traverse in Paper No. 11. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP§821.01.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 4, 5, 13-15, 30, 33, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igaki et al. (JP 11-23324) in view of Igaki (US Patent 5,124,548).

4. Regarding claims 1, 4, 5, and 30, Igaki et al. (JP) discloses an optical encoder for detecting an angle, speed, or position of relative rotation or translation comprising (Abstract): a light irradiating system, an optical scale having grating for transmitting or reflecting incident light, light receiving elements disposed in a plurality of different directions (Drawing 14); and an optical system constructed to amplitude-modulate light by the transmitting or reflecting grating, by a dividing element in which a plurality of V-grooves are juxtaposed (Drawing 13) to divide the light along a plurality of different directions to the light-receiving elements, wherein the dividing element is comprised of repetitions of such a structure that V-grooves consisting of planes of mutually different angles are juxtaposed at a predetermined pitch (Detailed description, [0012], "trapezoid-like"), and wherein the dividing element and optical scale are comprised of a common member in an outside region or inside region of the grating (Drawing 13 and 14).

However, Igaki et al. (JP) does not specifically disclose a driving system comprising: a driver system, a control system, and the optical encoder.

Igaki teaches a driving system comprising: a driver system, a control system and the optical encoder (Fig. 14). Igaki also teaches different V-groove angles (col. 4, lines 46-52).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the driving system of Igaki with the optical encoder of Igaki et al. (JP), since one would be motivated to have some form of an automated driving system to rotate the optical scale and operate as a feedback system as shown by Igaki (col. 6, lines 33-53).

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5. Regarding, claims 13-15 and 33, Igaki et al. (JP) discloses an optical encoder for detecting an angle, speed, or position of relative rotation or translation comprising (Abstract): a light irradiating system, an optical scale having grating for transmitting or reflecting incident light, light receiving elements disposed in a plurality of different directions (Drawing 13), wherein light travels to the scale slits of a first region to a condensing mirror or optical element to a second region of scale slits (Drawing 13). However, Igaki et al. (JP) does not specifically disclose the slope angles different or smaller for the first region than those of the second region and a driving system comprising: a driver system, a control system, and the optical encoder.

Igaki teaches a driving system comprising: a driver system, a control system and the optical encoder (Fig. 14).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the driving system of Igaki with the optical encoder of Igaki et al. (JP), since one would be motivated to have some form of an automated driving system to rotate the optical scale and operate as a feedback system as shown by Igaki (col. 6, lines 33-53).

Secondly, it would have been obvious, to one having ordinary skill in the art to have the slope angles different or smaller for the first region than those in the second with the suggested systems of Igaki et al. (JP) in view of Igaki, since a mere rearrangement of sizes is generally recognized as being within the level of ordinary skill in the art. As shown by Igaki, the slopes form any angle (col. 4, lines 46-52) meaning as long as it can easily separate the light into two directions. Thus, it would have been within the ability of one having ordinary skill in the art to choose any angle as long as the light beam incident on the inclined surfaces could be easily

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separated into different directions to be incident on the different light receiving devices.

Different slopes are shown in Drawing 13 between #31b-1 and #331b-2.

6. Regarding claim 35, Igaki et al. (JP) discloses an optical encoder for detecting an angle, speed, or position of relative rotation or translation comprising (Abstract): a light irradiating system, an optical scale having grating for transmitting or reflecting incident light, light receiving elements disposed in a plurality of different directions (Drawing 14), wherein light travels to the scale slits of a first region to a condensing mirror or optical element to a second region of scale slits (Drawing 14), wavefront division by a difference between reflecting directions (Drawing 13), and reflecting and transmitting portions for the first region having flat portions and V-grooves (Drawing 13). However, Igaki et al. (JP) does not specifically disclose a second region emitting beams in four different directions from different portions or a driving system comprising: a driver system, a control system, and the optical encoder.

Igaki teaches a driving system comprising: a driver system, a control system and the optical encoder (Fig. 14).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the driving system of Igaki with the optical encoder of Igaki et al. (JP), since one would be motivated to have some form of an automated driving system to rotate the optical scale and operate as a feedback system as shown by Igaki (col. 6, lines 33-53).

Secondly, it would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have a second region emit beams in four different directions with the

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suggested systems of Igaki et al. (JP) in view of Igaki, which is explained with motivation as follows.

Since the change in planes and rearrangement of V-grooves as explained above would be within the general skill for one having ordinary skill in the art, the change to have four different beams would obviously follow. Lacking any criticality, one may choose to have the second region emitting beams in two, three, four, five, six, or any plurality of directions from different portions, respectively. The number of different beams emitted from a respective position can change as long as the beams emitted from the second region diverge from each position based on the slit pattern of the encoder. Since one can use any slit pattern involving flats and grooves, an infinite number of patterns can emerge from the second region.

7. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igaki et al. (JP) in view of Igaki as applied to claim 1 above, and in further view of Igaki et al. (US Patent 5,483,059).

8. Regarding claim 2, Igaki et al. (JP) in view of Igaki discloses an optical encoder as recited above. However, Igaki et al. (JP) does not disclose the dividing element forming at least one set of beams having a phase relation of 180° .

Igaki et al. (US) teaches at least one set of beams having a phase relation of 180° (col. 10, lines 9-18).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the phase relation of 180° of Igaki et al. (US) with the suggested

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systems of Igaki et al. (JP) in view of Igaki, since one would be motivated to have any phase difference to create an analog signal to detect displacement information as shown by Igaki et al. (US) (col. 10, lines 38-39).

9. Regarding claim 3, Igaki et al. (JP) in view of Igaki and Igaki et al. suggests an optical encoder as recited above. Igaki et al. (JP) further discloses repetition two types of different planes (Fig. 4b). However, Igaki et al. (JP) does not specifically disclose the dividing element comprising repetitions of four types of different planes.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have repetitions of four types of different planes with the suggested systems of Igaki et al. (JP) in view of Igaki, since the change of in the number of planes for V-grooves would be within the general skill for one having ordinary skill in the art. This is exemplified in the prior art. Igaki teaches zero different planes in one embodiment (col. 2, lines 57-60) to separate light into different directions. Igaki further teaches the capability of having two different planes (col. 4, lines 46-53) to separate light into different directions. Thus, one may choose to have repetitions of zero, two, four, six, eight, ten, or any even number of different planes as long as it caused the light beam incident on the inclined surfaces to easily be separated into different directions to be incident on different light receiving devices.

Response to Arguments

10. The Examiner withdraws the statement with regards to the Information Disclosure Statement recited in Office Action mailed October 17, 2001. Further review does reveal only one filing of the Information Disclosure Statement dated August 7, 2000.

11. The objections to the drawings have been withdrawn in light of the amendments and proposed drawings filed March 1, 2002.

12. Applicant's arguments filed March 1, 2002, have been fully considered but they are not persuasive.

With regards to claims 1 and 30, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., different angled slopes by which four beams can be directed toward the light-receiving elements) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. Further Igaki et al. does show a dividing element comprised of repetitions of such structure that a plurality of V-shaped grooves (Drawing 13, #31b-1 and 31b-2) consisting of planes of mutually different angles (Drawing 13, one slope of #31b-1 and the other slope of #31b-1) are juxtaposed at a predetermined pitch (Drawing 13, #31a).

With regards to claims 13 and 33, different slopes is still obvious as shown by Igaki et al. (Drawing 13, #31b-1 and 31b-2).

With regards to claim 35, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., reflected by the second region) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glen Kao whose telephone number is (703) 605-5298. The examiner can normally be reached on M - Th (8 am to 5 pm).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

gk
October 31, 2002

